

A NEW SPECIES OF *APHELINUS* DALMAN (HYMENOPTERA:  
CHALCIDOIDEA: ENCYRTIDAE)

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*Abstract.*—A new aphelinid is described: *Aphelinus prociphili*, a parasite of the pemphigine aphid, *Prociphilus fraxinifolii* (Riley), on *Fraxinus* in Iowa, USA.

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Members of the genera *Aphelinus* Dalman, *Mesidia* Foerster, *Mesidiopsis* Nowicki and *Protaphelinus* Mackauer (Chalcidoidea, Encyrtidae) are the only hymenopterons besides those of the Aphidiidae (Ichneumonoidea) reliably known to be primary parasites of aphids. *Mesidia* and *Mesidiopsis* are probably not generically distinct from *Aphelinus*, and *Protaphelinus* is monotypic.

The most common aphid hosts of aphelinids belong in the subfamilies Aphidinae and Callaphidinae. The aphelinid described below is only the third species known naturally to parasitize members of the Pemphiginae; the others are *Aphelinus mali* (Haldeman), the well-known biocontroller of *Eriosoma lanigerum* (Hausmann), the woolly apple aphid, and *Protaphelinus nikolskajae* (Jasnosh), a parasite of gall-forming *Pemphigus* Hartig on *Populus*.

There have been no recent, comprehensive taxonomic studies of Nearctic, aphidophagous aphelinids, at least 20 species of which have been listed (Gordh, 1979; Mackauer, 1972).

*Aphelinus prociphili* Carver, NEW SPECIES

Fig. 1

Male.—*Living specimens*: Head black. Antenna with scape brown, pedicel and 1st and 2nd segments of funicle light brown, 3rd funicular segment and club yellow. Thorax black. Legs with all coxae black except perhaps extreme apices; fore leg with trochanter light brown, femur brown except for pale apical area, tibia pale to slightly fuscous, tarsus pale; mid leg with trochanter white, femur black except at extremities, tibia blackish brown, basally and apically paler, tarsus pale; hind leg with trochanter, femur, and



Fig. 1. *Aphelinus prociphili*, holotype male.

base of tibia white, rest of tibia blackish brown, basitarsus brown, 2nd to 5th tarsomeres pale to light brown; all claws dark. Fore wing may be slightly infuscated near stigma and marginal vein. Abdomen with at least basal segment yellow or white, otherwise brown.

*Macerated specimens:* Body length 1.08–1.27 mm (mean, 1.18). Head as wide as thorax; temples lacking; dorsally with fine scalelike reticulations; frons archly invaginated as far as median ocellus (to receive antennal scapes). Eyes moderately pubescent. Ocelli moderately large. Mandible with ventroapical tooth well defined; middle tooth ventrally so; dorsoapical tooth blunt, hardly delimited; ventral tooth blunt.

Antenna mean length (including radicle) 0.52 mm,  $0.42\text{--}0.46 \times$  body length. Scape mean length (excluding radicle), 0.17 mm, greatly swollen, length only  $2.1\text{--}2.6 \times$  maximum width, which is subequal (0.9–1.1) to length of pedicel; subequal in length (0.9–1.0) to pedicel and funicle combined and somewhat longer (1.1–1.2) than club; ventral surface (of slide-mounted specimens) with large, unilaterally-delimited plaque bearing irregular row of 13–17 placoid sensilla; otherwise smooth to faintly and narrowly reticulated and partly hairless; dorsal surface finely and broadly reticulated with about 7,

irregular, transverse rows of up to 7 setae (18–19  $\mu\text{m}$  long) socketed at junctures of reticulations. Pedicel mean length 0.07 mm, 2.1–2.3  $\times$  maximum width. First funicular segment 0.02–0.03 mm long, 1.0–1.2  $\times$  maximum width. Second funicular segment 0.02–0.03 mm long, transverse to quadrate (length, 0.7–1.1  $\times$  width). Third funicular segment mean length 0.06 mm, 1.5–2.0  $\times$  maximum width, 1.1–1.3  $\times$  combined lengths of 1st and 2nd funicular segments. Club mean length 0.15 mm; relatively slender, narrowing apicad, length 2.9–3.9  $\times$  maximum width, 1.8–2.1  $\times$  length of pedicel and 1.2–1.4  $\times$  length of funicle. Flagellar setae plentiful, apicad becoming progressively longer and finer. Linear sensilla on 3rd funicular segment and club.

Mesoscutum with fine, scalelike reticulations; bearing many stout setae; posterior pair largest, about 83  $\mu\text{m}$  long. Scutellum with fine, scalelike reticulations; scutellar setae 84–104  $\mu\text{m}$  long; distance between posterior pair 1.5  $\times$  distance between anterior pair. Prosternum hexagonal, broader than long (5:4), with posteromedian crest; anterior sides longest, straight and perpendicular to one another; middle sides straight, little longer than posterior sides which are concave and form acute angle between medianly contiguous fore coxae.

Fore wing length 0.81–0.85  $\times$  body length and 2.3–2.4  $\times$  maximum width; costal cell length 7.8–9.4  $\times$  width, bearing 23–38 setae disposed in 2 complete rows and an incomplete row; submarginal vein equal in length to or very slightly longer than (1.0–1.1) marginal vein and bearing 5–6 setae; speculum (i.e. the oblique, linear, hairless area running posterobasally from stigma to hind margin) not crossed subposteriorly by line of setae; delta area (i.e. setaceous area basad of speculum and posterior to marginal vein) composed of 29–51 setae disposed parallel to speculum as one complete line of 15–21 setae and 3–4 incomplete lines of 11–30 setae; setae absent from basal area (i.e. area posterior to submarginal vein).

Legs with hind tibia 0.36 mm long, 0.30–0.31  $\times$  body length; mid tibial spur hirsute, as long as or a little shorter than mid basitarsus; tarsal claws small, of equal length.

Abdomen with sides rounded at base; ventrally and medianly with irregular rows of many, variably sized setae of maximum length 33–43  $\mu\text{m}$ ; mean length of phallus (excluding aedeagus), 0.26 mm.

Female.—Differs principally from male as follows: Scape and pedicel light brown, funicle and club yellow, ovipositor sheaths slightly fuscous; apical sternite pale.

Antenna mean length 0.43 mm, 0.34–0.35  $\times$  body length. Scape mean length 0.15 mm, slender, laterally compressed; length 3.6–4.6  $\times$  maximum width, 0.9–1.0  $\times$  combined lengths of pedicel and funicle, and 1.2–1.4  $\times$  length of club; narrow longitudinal reticulations and setae (about 15  $\mu\text{m}$  long) concentrated on one surface; placoid sensilla absent. Pedicel mean

length 0.07 mm, 2.0–2.5 × maximum width. First funicular segment 0.02 mm long, transverse to quadrate (length 0.83–1.0 × maximum width). Second funicular segment 0.02 mm long, transverse (length 0.85–0.93 × maximum width). Third funicular segment mean length 0.04 mm, 1.1–1.4 × maximum width, 0.8–1.0 × combined lengths of 1st and 2nd segments. Club mean length 0.12 mm, 2.5–3.0 × maximum width, 1.6–1.8 × length of pedicel and 1.35 × length of funicle; setae shorter than in male. Length of fore wing 0.75–0.77 × body length. Length of hind tibia 0.27–0.28 × body length. Ovipositor sheaths mean length 0.14 mm, oar-shaped, 8.0 × maximum width.

Measurements and means given are of 8 males (including holotype) and 8 females (including allotype).

Types.—Holotype ♂ (on slide), ex *Prociphilus fraxinifolii* (Riley) on *Fraxinus* sp. (ash), USA: IOWA, Iowa City, University campus, 17 July 1978, M. Carver (USNM type no. 76661). Allotype ♀ (on slide) and 35 ♂ and 35 ♀ paratypes (on slides, preserved in ethanol and dry), same data as holotype. Holotype, allotype, and paratypes deposited in the U.S. National Museum of Natural History, Washington D.C., paratypes also in the Australian National Insect Collection, CSIRO, Canberra, A.C.T., Australia, and the British Museum (Natural History), London.

Remarks.—The greatly swollen, multisensoriate scape of the antenna of the male (Fig. 1) immediately distinguishes *A. prociphili* from all other described species of *Aphelinus*. The female is similar to *A. chaonia* Walker, an adventive (Gordh, 1979) of European origin, from which it is most conveniently differentiated by its conspicuously pale abdominal base. The males, however, of several species of Nearctic *Aphelinus* are unknown or undescribed. The female of *A. prociphili* does not match the descriptions of any of these, nor are the host associations of these species comparable with that of *A. prociphili*.

The black mummies of *A. prociphili* were very common amongst the woolly-waxy colonies of their pemphigine host in curled leaves of *Fraxinus*, together with black, parasitized puparia of Chamaemyiidae (Diptera). The specialized nature of host and habitat suggests that *A. prociphili* may be restricted in its host range to *Prociphilus* Koch and its pemphigine, leaf-curling relatives. *Prociphilus* occurs in the Holarctic and Oriental regions; *P. fraxinifolii* itself is a widespread North American species.

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## LITERATURE CITED

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## NOTE

Transfer of Microlepidoptera Types to the  
Smithsonian Institution

In "Microlepidoptera of the Philippine Islands" (U.S. Natl. Mus. Bull. 257, 1967 [actual date of publication 31 January 1868]), Diakonoff indicated that certain holotypes had been designated for deposit in the Field Museum of Natural History, Chicago, Illinois.

These types are now deposited in the collection of the Department of Entomology, U.S. National Museum of Natural History, Smithsonian Institution, Washington, D.C., and are listed below for the information of anyone concerned.

Tortricidae.—*Archidemis anastea* Diakonoff; *Stenarchella eupista* Diakonoff.

Olethreutidae.—*Costosa allochroma* Diakonoff; *Strepsicrates discobola* Diakonoff.

Corposinidae.—*Meridarchis scythrophyes* Diakonoff; *M. bifracta* Diakonoff; *Heterogymna melanocrypta* Diakonoff.

Xyloryctidae.—*Metathrinca pernivis* Diakonoff.

Lecithoceridae.—*Tisis auricincta* Diakonoff.

Cosmopterigidae.—*Scaeothyris pseusta* Diakonoff.

Heliodinidae.—*Craterobathra demarcata* Diakonoff; *C. argyracma* Diakonoff.

Yponomeutidae.—*Anticrates denticulata* Diakonoff.

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